CASE REPORT JSLS

Intestinal Obstruction After Totally Extraperitoneal Laparoscopic Inguinal Hernia Repair

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ABSTRACT

Laparoscopic hernia repair is a frequently performed operation. Although it has many advantages over open inguinal hernia repair, laparoscopic surgery is not without complications. Small bowel obstruction is a complication unique to laparoscopic repair of inguinal hernias. It is reported following transabdominal preperitoneal repairs. We present a case of small bowel incarceration through a peritoneal defect after a totally extraperitoneal inguinal hernia repair. Techniques to avoid this complication are presented. The literature is reviewed.

Key Words: Totally extraperitoneal, Laparoscopic, Obstruction, Inguinal hernia.

INTRODUCTION

Inguinal hernia repairs are a very common procedure in the United States. The goals of laparoscopic repair versus open repair include decreased pain, faster recovery, less time lost from work, and lower recurrence and complication rates. The enthusiasm for laparoscopic procedures has led to their rapid acceptance with adequate investigations of some, but not all, of the possible perioperative complications.

Some of the complications are well known, including trocar injuries, port-site herniation, and neuropathy from improperly placed staples.[1-3] A less well-recognized complication after laparoscopic inguinal hernia repair is small bowel obstruction. This may be due to adhesions to, or entrapment under, the mesh as seen with the intraperitoneal on-lay mesh technique, which has been reported.[4,5] Several reports in the literature discuss obstruction after transabdominal preperitoneal repair (TAPP) due to small bowel herniation through, or adherence at, the site of the peritoneal closure.[1,6-8] The complication rate after totally extraperitoneal repair (TEP) is reported to be lower than that after TAPP.[9] The abdominal cavity is not entered in TEP; the risk of bowel obstruction after TEP was thought to be essentially zero.[10,11] However, a few reports do exist of bowel obstruction following TEP.[11,12] We present one such case and a review of the literature.

CASE REPORT

A 47-year-old male presented with bilateral inguinal hernias of 2-weeks duration. The patient noted the hernias while doing some heavy lifting at work. Over the next week, he had the intermittent appearance of a bulge in the groin, especially with straining or coughing. He denied any obstructive symptoms. He was otherwise healthy and had no prior abdominal surgeries.

Bilateral laparoscopic total extraabdominal preperitoneal hernia repairs were performed with the patient under general anesthesia. An infraumbilical incision was made down to the level of the posterior rectus sheath. The posterior sheath was not violated. A balloon dissector (Preperitoneal Distension Balloon and Inflation Bulb; Tyco Healthcare, Norwalk, CT, USA) was placed posteri-

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or to the rectus muscle fibers and anterior to the posterior rectus sheath. This was followed by insertion of a 10-mm 0° laparoscope into the lumen of the dissecting balloon. The dissecting balloon was inflated with air to develop the preperitoneal space. The balloon dissector was next replaced with a 10-mm structural trocar (Structural Balloon Trocar and Inflation Bulb; Tyco Healthcare, Norwalk, CT, USA). A 30° scope was inserted and used for the rest of the procedure. Three additional 5-mm ports were placed in the preperitoneal space, one midway between the umbilicus and pubic symphysis and one each medial to the right and left anterior superior iliac spines. A large direct defect was noted on the right. This was repaired first, followed by dissection and repair of the left side. The left side had components of both direct and indirect defects. The hernia sacs were dissected off the cord structures to the level of the peritoneum. The sacs were not entered during dissection nor were they amputated. A piece of 15x11-cm Prolene mesh was used to cover the defects on either side. The mesh was placed such that 2/3 of it covered the anterior abdominal wall and 1/3 covered the posterior surface. The mesh was secured to the pubic tubercle on either side, using Protacks (Protack, Tyco Healthcare, Norwalk, CT, USA). No Protacks were used to anchor the mesh to the lateral abdominal wall and inferior to the ileopubic tract. The inferior and lateral edges of the mesh were held in place with graspers while the preperitoneal space was deflated. The patient was discharged home on oral narcotics later that same day.

He returned 3 times, once on postoperative day 1, again on postoperative day 3, and a third time on postoperative day 7, each time with abdominal distention, nausea, and vomiting. No evidence was found of a recurrent hernia on examination. Acute abdominal series showed air-fluid levels and a distended small bowel. The patient was admitted and treated with nasogastric decompression and intravenous fluids. Each time, his symptoms resolved in less than 24 hours. On his second readmission, computed tomography (CT) scans of the abdomen and pelvis and a small bowel follow-through series were obtained. The CT scan did not show evidence of mechanical small bowel obstruction and was interpreted as being consistent with postoperative ileus. The small bowel follow-through showed delayed transit through the small bowel at 3 hours with contrast reaching the distal colon and rectum. This was also consistent with ileus. Due to the recurrent nature of his symptoms, the patient was advised to undergo laparoscopy at this time but refused. He tolerated a regular diet and went home. When he returned on postoperative day 7 with recurrent symptoms, laparoscopy was again recommended, and this time he consented.

At laparoscopy, a Veress needle was inserted into the left upper quadrant, away from the prior trocar sites. Pneumoperitoneum was obtained, and a 5-mm scope was inserted there. The anterior abdominal wall was inspected. No adhesions to the abdominal wall were observed. Additional ports were placed under direct visualization. Inspection of the peritoneal cavity showed that approximately 18 inches of small bowel had herniated through a defect in the peritoneum in the right lower quadrant **(Figure 1)**. The loops of bowel were incarcerated in the preperitoneal space adjacent to, but not adherent to, the mesh. The hernia repair was visualized through the peritoneal defect and was intact. The bowel was reduced from the preperitoneal space. No evidence of strangulation was found. The defect in the peritoneum **(Figure 2)** was repaired with a running 2-0 silk suture with intracorporeal suturing on an Endostitch device (Endostitch, Tyco Healthcare Norwalk, CT, USA) **(Figure 3)**. No other defects were found in the peritoneum. The bowel was run from the terminal ileum to Treitz's ligament. No other pathology was observed. The patient was discharged home the following day after tolerating a regular diet and demonstrating normal bowel function. He has had no further complications.

Figure 1. Incarcerated small bowel.

DISCUSSION

As experience with laparoscopic procedures continues to grow, vigilance for recognizing new complications should be maintained. The peritoneal defect described in our case likely occurred when the right lateral trocar was placed and went unnoticed during the procedure. Lodha et al[13] report a similar case of bowel entrapment in a peritoneal defect after a TEP hernia repair. They suggest that the defect in the peritoneum leads to gas accumulation intraabdominally. When the preperitoneal space is rapidly deflated at the end of the procedure, the force of the intraabdominal gas may push bowel through the defect. Rodda et al[14] have also suggested the equalization of pressures between the 2 compartments as a mechanism of bowel entrapment after TAPP. This highlights several important technical details of TEP hernia repairs.

First, a vigilant search for and repair of any peritoneal defects should be part of any TEP procedure. Petersen et al[15] describe a case of obstruction after TAPP due to a peritoneal defect. The defect was initially repaired with staples, but recurred. The second repair was done with absorbable sutures and did not recur. The best choice of repair for peritoneal defects appears to be a suture repair, as was done in our patient.

Secondly, evaluation of the abdominal cavity for possible pneumoperitoneum should be done after a TEP repair. Evacuation of the abdominal pneumoperitoneum prior to deflating the preperitoneal space would decrease the force that drives the bowel through a small peritoneal defect. This could be done with a Veress needle just prior to evacuating the preperitoneal space.

One of the advantages of laparoscopy is that it avoids the morbidity of a long abdominal incision. Small bowel obstruction after laparoscopic hernia repair as reported in the literature has been treated both laparoscopically and with laparotomy. We feel that this complication can be successfully managed laparoscopically. One caveat is that pneumoperitoneum should be established at a site remote from the original port sites. This avoids possible injury to bowel that may be adherent to port sites. This has been previously recommended by Riordan and Horgan.[16] In the case presented here, the Veress needle was placed in the left upper quadrant to avoid the site of suspected obstruction and avoid injury from the Veress needle. Another option would be to use the Hasson technique, but the Veress needle provides a better seal and can be placed without complications in most cases. The laparoscopic approach also allows excellent visualization to assess the hernia repair.

Another aspect of this case involves trocar placement during the initial repair. The first trocar was placed infraumbilically. Trocars 2 and 3 can be placed in the midline hypogastrium or medial to the iliac crests on either side of trocar 1. Both positions for trocar placement have been described and well accepted. Midline trocar placement might decrease the likelihood of an unnoticed peritoneal defect; however, in patients with a short distance between the umbilicus and pubic tubercle, not enough room exists to place 2 trocars in the midline.

Figure 2. Peritoneal defect.

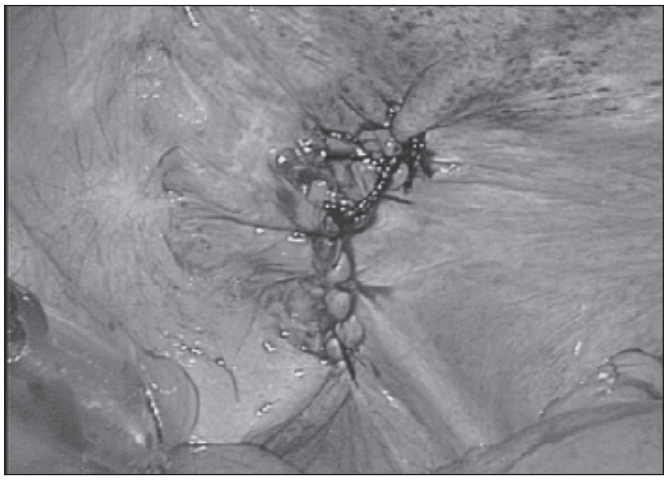

Figure 3. Suture repair of peritoneal defect.

Handling of the mesh can be especially difficult in these situations.

Increased awareness of bowel herniation through peritoneal defects will allow more rapid diagnosis and treatment. Most reports in the literature describe a 3- to 10-day delay in diagnosis prior to definitive treatment. As with our patient, it is easy to attribute their symptoms to postoperative ileus, possibly aggravated by narcotics. The recurrent nature of this problem should make the diagnosis obvious and hasten treatment. Expensive diagnostic tests like CT scans and small bowel follow-through could be avoided with a heightened index of suspicion for this complication.

CONCLUSIONS

Technical considerations that should be observed with TEP include a search for peritoneal defects, adequate repair of such defects, and evacuation of intraabdominal pneumoperitoneum prior to evacuation of the preperitoneal space. Attention to these technical details along with increased awareness of the possibility of bowel entrapment should reduce their incidence. Small bowel obstruction after TEP and other laparoscopic procedures can be managed laparoscopically to maintain the benefits of this approach. Knowledge of the presentation of small bowel entrapment in peritoneal defects could result in less costly and more timely intervention.

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